Atmos. Chem. Phys. Discuss., 4, S104–S106, 2004
www.atmos-chem-phys.org/acpd/4/S104/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "The EISCAT meteor-head method - a review and recent observations" *by* A. Pellinen-Wannberg

A. Pellinen-Wannberg

Received and published: 19 February 2004

I thank the Anonymous referee #1 about valuable comments.

This paper was based on my talk on the Radar Meteor Workshop. I was invited to talk about EISCAT results and I knew that there were separate review talks from the other radars, thus I did not refer much to results from other facilities. Next my response to the referee.

General comments

1. The correct name should be Barker-coded alternating codes, since every baud in the alternating code sequencies is coded with a 13-baud Barker code. The use of this method is quite extensive described in our first paper (Pellinen-Wannberg and Wannberg, JGR, 99, 11379, 1994). Alternating code sequencies form the base vectors of a set which is orthogonal under the operation of a sum of lagged products. The

method is used to observe a diffuse target which remains stationary during the time needed to transmit and receive all members of the code set. If the properties of the target changed very rapidly, the orthogonality criterion would fail resulting in a very messy signal. The method can be used to distinguish between head echoes with a very slow component along the observation direction (a process of some 10 ms but still transient) and trail echoes lasting for several hundreds of milliseconds.

I do not know if this description is enough, the method is quite difficult. In addition, we have not used it in a long time. My suggestion is that I just skip the Şalternating Barker codesŤ.

2. and 5. I will add a figure showing meteors in electron density time series and a figure describing the old and new tristaitc configurations.

3. I change this sentence to: "HPLA radars usually have very narrow beams due to their good resolution. The wavelenght diameter quotient is around 1°".

4. The only facility that has done comparable measurements in comparable frequency ranges is the ALTAIR radar. Arecibo (46.8 MHz) and Jicamarca (50 MHz) frequencies are much lower. I do not think there are any published results from Millstone. Neither ALTAIR results are discussed in these terms, but in Hunt et al. (Proc. Meteoroids 2001, ESA SP-495, 451-455, 2001) the effect is clearly seen in their Fig.1. Even in that study the altitude range has been cut in the upper edge. In addition, Close et al., (Icarus, in press, 2004) confirm in their theoretical paper that the VHF distribution should be slightly higher up than the UHF.

I have not added all this in the present paper, since I presented EISCAT results - the only study dedicated to the altitude distributions. I suggest to add a reference to Close et al., 2004 theoretical calculations, which I was not fully aware of when I wrote the present paper.

6. Since we are working on a paper describing the whole problem, I rather take away

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this sentence at this stage. To explain why would take a lot of space, and as it is present the sentence just confuses.

7. We do not have any radial velocity distributions for the VHF meteoroids. The velocities we have analysed from it, are limited to the ones we also could see with the UHF and are from 1991 and 1993 (Wannberg et al., RS, 31, 497-518, 1996). That is a small sample. In addition, the method at that time was optimised to UHF range, and thus not good for very low and high velocity meteors at VHF. Today we could perform much better observations separately optimised for the both systems.

Technical comments

1. Usually signal temperature is used at incoherent scatter radars, but I can change it to signal power.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 21, 2004.